

1. A simultaneous electrochemical assay comprising a substrate having a plurality of analyte binding areas, each of said analyte binding areas adapted to bind a different specific analyte; and a plurality of working electrodes each working electrode adjacent to one analyte binding area and separated from the nearest adjacent analyte binding area by a distance effective to permit a measurement by each electrode of analyte bound to its adjacent analyte binding site and not measure an interfering amount of analyte bound to said nearest adjacent analyte binding site.

*sub*  
*a'*  
~~11~~

*Sub P1*

2. The assay claimed in claim 1 wherein said binding sites comprise a plurality of different analyte specific proteins.

3. The assay claimed in claim 1 wherein said binding sites each comprise a different antigen.

5 4. The assay claimed in claim 1 wherein each binding site comprises a different antibody.

5. The assay claimed in claim 1 further comprising at least one auxiliary electrode.

Sub  
H1

6. A method of testing for a plurality of different analytes in a test solution using a test cell having a plurality of spaced analyte binding sites wherein each binding site is specific for a separate analyte; locating separate electrodes adjacent to each binding site and spaced from an adjacent binding site;

5 adding a test solution to said cell;

adding reagent to said cell wherein portions of said reagent react with each of said analytes and wherein said reagent includes at least one label

10 electrochemically detecting said label at each of said electrodes in less than a time in which label-produced product at any binding site can migrate to an adjacent binding site.

*Sub HJ*

7. The method claimed in claim 6 wherein said label contains an enzyme and further comprising adding substrate to said cell wherein said label is detected by measuring a reaction product of said enzyme and said substrate.

5 8. The method claimed in claim 7 wherein said product is measured amperometrically.

9. The method claimed in claim 6 wherein said binding site comprises a plurality of analyte specific proteins and said reagent comprises a plurality of analyte specific proteins each labeled with the  
10 same label.

*add  
a<sup>2</sup>*

*add  
a<sup>3</sup>*